NON-PUBLIC?: N
ACCESSION #: 8805040168
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Salem Generating Station - Unit 1 PAGE: 1 of 4

DOCKET NUMBER: 05000272

TITLE: Unit 1 Manual Reactor Trip Due to Loss of EH Pumps 11 and 12 - Poor Communication in Conjunction With Equipment Failure
EVENT DATE: 03/30/88 LER #: 88-009-00 REPORT DATE: 04/28/88

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R. K. Heller - LER Coordinator TELEPHONE #: 609-935-6000

COMPONENT FAILURE DESCRIPTION:
CAUSE: E SYSTEM: JJ COMPONENT: GAGE MANUFACTURER: R337

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On March 30, 1988, at 1143 hours, No. 12 EH (JJ) Pump tripped and No. 11 EH Pump failed to automatically start. With the loss of the EH pumps, and decreasing pressure in the control oil system, the Turbine Governor Valves (JJ) began to drift shut. The Reactor (AC) was subsequently manually tripped due to increasing Tavg. Prior to this occurrence, leakage of EH control oil had been noted issuing from the 12 and 13 MS29 Valves (JJ) and the EH reservoir had been refilled several times by the EOs. During this occurrence the mechanical level indicator had apparently malfunctioned as it continued to indicate a normal to high level although the actual sump level had reached the EH pump low level lockout setpoint. The apparent "root cause" of this occurrence has been attributed to poor communication resulting in not adequately investigating the cause of the constant EH high/low reservoir level alarm in conjunction with equipment failure.

(End of Abstract)

TEXT: PAGE: 2 of 4

PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as (xx)

IDENTIFICATION OF OCCURRENCE:

Unit 1 Manual Reactor Trip Due to Loss of EH Pumps 11 and 12 - Poor Communication in Conjunction With Equipment Failure

Event Date: 03/30/88

Report Date: 04/28/88

This report was initiated by Incident Report No. 88-115.

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 Reactor Power 100% - Unit Load 1162 MWe

DESCRIPTION OF OCCURRENCE:

On March 26, 1988, the Electro-hydraulic (EH) control oil reservoir hi/low bezel level alarm (JJ) was received in the Control Room and would not clear. Subsequent readings of the local mechanical level indication indicated that the reservoir was full. This condition persisted for four days, until on March 30, 1988, at 1143 hours, No. 12 EH (JJ) Turbine Control Oil Pump tripped and No. 11 EH Pump failed to automatically start. The Equipment Operator (EO) was sent to the breakers to attempt to start the pumps manually, however, the breakers would not close in. With the loss of the EH pumps, and decreasing pressure in the turbine control oil system, the Turbine Governor Valves (JJ) began to drift shut. As a result of this situation, Tavg began to increase with the decreasing steam flow. Due to the increase in Tavg, the Reactor (AC) was manually tripped by order of the Senior Nuclear Shift Supervisor.

APPARENT CAUSE OF OCCURRENCE:

Subsequent investigation revealed that the EH Pumps would not restart because they were locked out automatically due to a low low level condition in the EH control oil reservoir. The mechanical level indicator had apparently malfunctioned as it continued to indicate a normal to high level although the actual sump level had reached the low level alarm setpoint. The level in the sump continued to decrease

from the receipt of the alarm to below the pump lockout setpoint.

APPARENT CAUSE OF OCCURRENCE: (cont'd)

Since the Unit had been returned to service at the end of February, 1988, leakage of EH control oil had been noted issuing from the 12 and 13 MS29 Valves (JJ). During this period, the EH reservoir had been refilled several times by the EOs. This action is part of their normal duties and does not require permission from the Control Room.

With the hi/low level bezel alarm in, shift supervision increased the frequency of the reading of the EH reservoir level. The initial check of the local mechanical level indicator, following receipt of the alarm, indicated the level to be approximately 7/8 full. Therefore, it was determined that the bezel alarm was due to a possible high level condition. Due to the constancy of the level alarm, a work request was written on the second day of this occurrence to have the problems with the level indication investigated. However, the assumption was that the local level indication was accurate and the bezel alarm was malfunctioning. Therefore, no attempts were made to verify the accuracy of the local mechanical level indication.

A review of the EO logs, during the period in question, shows that the local EH reservoir mechanical level indication constantly read approximately 7/8 full and therefore did not prompt the EOs to refill the reservoir. Because personnel are rotated in their watchstanding assignments no individual EO was aware that the local level indication remained constant even though the sump had not been refilled. This fact could have been highlighted during watch turnover but was apparently missed.

Therefore, the apparent "root cause" of this occurrence has been attributed to poor communication resulting in not adequately investigating the cause of the constant EH high/low reservoir level alarm in conjunction with equipment failure of the local mechanical level indication.

ANALYSIS OF OCCURRENCE:

Reactor protection during power operation, for slower developing transients such as this, is provided by the Over Temperature Delta Temperature and Over Power Delta Temperature circuits. The manual trip was anticipatory in nature and is standard practice to prevent undue demand on the automatic protection system.

All systems functioned as designed and the Reactor was placed in a stable condition. Therefore, this occurrence presented no undue risk to the health and safety of the public. However, due to the manual actuation of the Reactor Protection System, this occurrence is reportable in accordance with the Code of Federal Regulations, 10CFR50.73(a)(2)(iv).

CORRECTIVE ACTION:

To prevent recurrence and address the multiple contributing factors identified in this report, the following corrective actions either have been or will be taken:

1. The subject of this report will be addressed in the Operations Department Newsletter to alert personnel to thoroughly investigate and determine the cause of alarms, and take all contributing factors into account.

2. Operations Department management will review this occurrence, including more thorough watch turnover and communication, with all of the operators.

3. The Nuclear Training Center will review the training segments which address the EH system.

4. The mechanical level indicator has been replaced with a dipstick to provide more reliable local level indication. Other methods of level indication are under review.

5. A review is underway to determine the possibility of splitting the high and low level alarms.

6. The EH leaks from the MS28 & 29 Valves have been repaired.

7. Operations Department personnel and the Systems Engineers are reviewing the applicable procedures for possible changes.

Additionally, a Human Performance Evaluation System (HPES) evaluation is being performed to analyze the human and man-machine interface factors which contributed to this occurrence. Further corrective actions, if necessary, will be implemented on the basis of the findings of this evaluation. This evaluation will also address the issue of poor communications between the watchstanders and make

appropriate recommendations.

/s/ J. M. Zupko, Jr.
General Manager -
Salem Operations

RKH:pc
SORC Mtg. 88-037

ATTACHMENT # 1 TO ANO # 8805040168 PAGE: 1 of 1

PSE&G
Public Service Electric and Gas Company P.O. Box E
Hancocks Bridge, New Jersey 08038

Salem Generating Station

April 28, 1988

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Dear Sir:

SALEM GENERATING STATION
LICENSE NO. DPR-70
DOCKET NO. 50-272
UNIT NO. 1
LICENSEE EVENT REPORT 88-009-00

This Licensee Event Report is being submitted pursuant to the requirements of Nuclear Regulatory Commission requirements 10CFR 50.73(a)(2)(iv). This report is required within thirty days of discovery.

Sincerely yours,
/s/ J. M. Zupko Jr.
J. M. Zupko, Jr.
General Manager-
Salem Operations
RKH:pc
Distribution

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